Renewable Electricity Technician

Associate in Applied Science Degree (AAS)

Overview

The Renewable Electricity Technician program will prepare technicians who design, install, operate and maintain solar and wind electricity generating systems for both residential and light commercial applications. Technicians will perform site assessments and integrate new renewable electricity systems with current existing energy sources. Renewable electricity technicians may be involved in the sale or marketing of solar PV and wind energy technologies.

The Renewable Electricity Technician program is offered at the Wisconsin Rapids campus.

Program Outcomes

Employers will expect you, as a Renewable Electricity Technician graduate, to be able to:

- Work safely with renewable electric systems
- Install subsystems and components at the site
- Perform a system checkout and inspection
- Maintain and troubleshoot a system
- Select a system design
- Adapt the mechanical design
- Adapt the electrical design
- Conduct a wind site assessment
- Conduct a solar photovoltaic site assessment

Career Options

Condition Monitoring Technician
Controls Technician
Customer Service Representative
Electrical Workers/Laborers
Measurement Technician
Photovoltaic System Installation, Maintenance and Service Technician
Photovoltic System Sales Representative
Service Technician
Solar PV Site Assessor
Wind Farm Service Technician
Wind Site Assessor
Wind System Installation, Maintenance and Service Technician
Wind System Sales Representative

Potential for Advancement

Electrical Construction Superintendent
Energy Analyst
Journeyperson: Electrician
Lead Installer
Master Technician
Project Development Engineer
Project Manager
System Designer

Potential advancement generally requires further education or training.

Admissions Procedures

To apply to the Renewable Electricity Technician program, please submit the following to MSTC Student Affairs Admissions Office:

1. WTCS application form and $30 non-refundable application fee
2. Completed Accuplacer test. (Other test scores may be acceptable alternatives.) Entrance exam requirements for the Renewable Electricity Technician program are:
   - Reading–Accuplacer score of 55 or equivalent
   - Language–Accuplacer score of 60 or equivalent
   - Math–Accuplacer score of 34 or equivalent

   If a student does not meet the required scores in these academic areas, they may remediate and retest or complete an identified structured remediation course(s) in the Academic Support Center.
3. High school transcript or GED/HSED scores

Mid-State Technical College
Admissions
500 32nd Street North
Wisconsin Rapids, WI 54494
mstc.edu
888.575.MSTC

Program Course Descriptions

10001148
People, Resources & Biosphere **3 credits**
Global resource and environmental problems from a historic, socioeconomic and biological perspective.

10103106
Microsoft Office-Beginning **3 credits**
Develops introductory skills in the Microsoft Office Suite (Word, Excel, Access, PowerPoint), Windows Explorer, Internet and computer concepts through demonstrations and lab exercises.

10103124
Excel-Intermediate **1 credit**
Develop skill to write and debug macros, create custom menus, perform database functions and develop graphs. Prerequisite: Microsoft Office-Beginning 10103106 or Excel-Beginning 10103123

10468100
Alternative Energy Overview **2 credits**
In this course, students will investigate the need for renewable energy systems and emerging careers in renewable energy. Students will examine the basic design, function, cost and other considerations associated with various "green" energy systems, including solar photovoltaic, solar thermal, wind, geothermal and biomass. Students will also explore the production and use of alternative transportation fuels.

10482100
Intro to Renewable Electricity 2 credits
Students in this course will learn the basics of renewable electricity generation with particular emphasis on wind and solar energy. Topics will include wind and solar resources, basic system components (including design considerations), system types and applications.

10482101
Wind & PV Site Assessor Training 2 credits
Students will learn the steps to perform wind and PV site assessments of a home or business. Course will cover: measuring wind energy potential, solar window determination, load analysis, site selection, system types, system sizing and efficiency measures, energy output estimation. The course will also cover an overview of existing renewable electric incentive programs and permitting procedures. Prerequisite: Intro to Renewable Electricity 10482100

10482105
Building Codes & Standards 3 credits
This course will cover the building codes and standards relevant to the installation of renewable energy systems. Additionally the LEED Certification and Wisconsin Green Built Home standards will be presented.

10482107
Construction Fundamentals 3 credits
Students will study the concepts associated with the theory, materials, and methods used in construction to include footings and foundations, walls, floors, roofs and roof materials, exterior finishes, interior walls, ceiling and floor finishes, insulation types, vapor and air infiltration and sound protection. Additionally, students will become familiar with blueprint reading and examine all the trades associated with construction including, electrical, HVAC and plumbing. The safe use of the appropriate tools for each trade will also be covered.

10482110
Photovoltaic System Design & Installation 2 credits
Students will learn the details involved in sizing and siting a PV system and gain a basic understanding of PV system installation. Topics include: system components, product specifications, product integration, system design capabilities and limits, system diagramming, wiring configurations, battery connections, safety, National Electrical Code, common design mistakes and solutions, wiring techniques and installation techniques. This course will involve students in the installation of a photovoltaic system. Prerequisite: Intro to Renewable Electricity 10482100

10482111
Photovoltaic System Maintenance & Installation 2 credits
This course is a continuation of PV System Design and Installation and will involve students as the lead installer in a second photovoltaic installation. System maintenance principles will also be covered. Prerequisite: Photovoltaic System Design & Installation 10482110

10482115
Utility Interconnect & Metering 2 credits
This course will cover Wisconsin's utility interconnect standard and net metering policies. This course will also provide an overview of electrical power distribution and transmission networks.

10482120
Wind Systems Installation I 2 credits
This course will involve students in the installation of a residential system. Topics include safety, system design and layout, National Electrical Code, component selection, wiring techniques and installation techniques. Prerequisite: Wind & PV Site Assessor Training 10482101

10482121
Wind Systems Installation II 2 credits
This course is a continuation of Wind System Installation I and will involve students in a large residential/small commercial installation. The course will include an optional tower climbing opportunity. Prerequisite: Wind Systems Installation I 10482120

10482122
Wind Systems Repair & Maintenance 2 credits
This course will include both bench-top and field maintenance and repair of wind turbines. Turbines from 1kW to 20kW will be covered. Fieldwork will include freestanding, guyed, and tilt-up towers. The course will include an optional tower climbing opportunity. Prerequisite: Wind Systems Installation II 10482121

10605105
Electrical Circuits I 3 credits
An introduction to AC/DC electricity and the physical laws that apply to electronic circuits. Direct Current (DC) covers basic definitions of voltage, current and resistance and analysis of series and parallel resistive circuits. Alternating Current (AC) includes an introduction to AC generation, capacitors, inductors and transformers and their applications in electronic circuits. Approximately 50% of the course is spent in the laboratory applying the principles and theory presented in the classroom. Corequisite: 10804113 College Tech Math 1A or Elementary Algebra w/Applications 10804110

Curriculum

First Semester		**(16 credits)**
10103106	Microsoft Office-Beginning	3
10482100	Intro to Renewable Electricity	2
10482105	Building Codes & Standards	3
10482107	Construction Fundamentals	3
10606105	Intro to AutoCAD	2
10801195	Written Communication	3
Second Semester		**(17 credits)**
10001148	People, Resources & Biosphere	3
10103124	Excel-Intermediate	1
10468100	Alternative Energy Overview	2
10482110	Photovoltaic System Design & Installation	2
10605105	Electrical Circuits I	3
10804110	Elementary Algebra with Applications	3
10809143	Microeconomics	3
	or	
10809144	Macroeconomics	3
Third Semester		**(17 credits)**
10482101	Wind & PV Site Assessor Training	2
10482111	Photovoltaic System Maintenance & Installation	2
10482120	Wind Systems Installation I	2
10482121	Wind Systems Installation II	2
10605127	Electrical Machines	3
10801196	Oral/Interpersonal Communication	3
	or	
10801198	Speech	3
10809122	Intro to American Government	3
Fourth Semester		**(18 credits)**
10482115	Utility Interconnect & Metering	2
10482122	Wind Systems Repair & Maintenance	2
10605170	Instrumentation & Control Devices	4
10809172	Race, Ethnic & Diversity Studies	3
	or	
10809196	Intro to Sociology	3
10809198	Intro to Psychology	3
	Elective	1
	Elective	3
	Total Credits	**68**

Please Note:

- The Renewable Electricity Technician program has August and January starting dates. However, we advise you to meet with a counselor to successfully plan you're academic schedule.
- Degree completion time may vary based on student scheduling needs and course availability.
- For General Education course descriptions (800 level courses), see section marked under Course Descriptions.

10605127
Electrical Machines **3 credits**
Designed to teach fundamentals of generators and motors. Covers DC and AC generators and motors. Prerequisite: Electrical Circuits I 10605105

10605170
Instrumentation & Control Devices **4 credits**
A study of controlling devices and systems utilized in generation, distribution and transmission of electricity. Students study instrument transformers, protective relays, protective systems, power system standards, drawing conventions, equipment rating terminology, insulation, circuit interrupting devices, grounding and power system faults. Prerequisite: Electrical Machines 10605127

10606105
Intro to AutoCAD **2 credits**
This is an introductory course in computer aided drafting (CAD) using AutoCAD software. It will provide foundation skills in using CAD software to create and print two dimensional technical drawings. This course is available to students in any program. Prior knowledge of drafting techniques is recommended.